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Positive Industrial Policy: The Implications for R&D

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TORONTO...A study on industrial policy prepared for the Ontario Economic Council questions the validity of the arguments put forward by the proponents of increased government support for research and development (R&D) in Canada.

The study, **Positive Industrial Policy: The Implications for R&D,** was written by University of Toronto Economics Professor Yehuda Kotowitz. It is the fifth in a series of studies on industrial policy prepared for the Council, under the auspices of the Institute for Policy Analysis of the University of Toronto, by a group of researchers at U of T and McGill University headed by Richard M. Bird and Christopher Green.

Professor Kotowitz explains that industrial policy in Canada has generally followed two avenues – tariff protection and incentive schemes. Both approaches have been used mostly in support of industries that have difficulty competing internationally, such as textiles and shoes. Recently, however, **pressures have been mounting to change this policy of propping up losers to one of supporting winners – that is, growth industries in general and those in which we may have a comparative advantage in particular.**

This report reflects the views of the author and not necessarily those of the Ontario Economic Council. The Council establishes policy questions to be investigated and commissions research projects, but it does not influence the conclusions or recommendations of authors. The decision to sponsor publication of this study was based on its competence and relevance to public policy and was made with the advice of anonymous referees expert in the area.

Attention has focused mainly on inducements to the private sector to increase applied industrial research and development as a means of generating innovation and the expansion of 'high-tech' industries. Proponents of such inducements argue that these industries will grow more rapidly than other industries and hence will generate the best employment prospects for the future. The study argues that the main justification for general government support of R&D arises from benefits to Canadians over and above those which accrue to the R&D investors – due for example to possible excess of social over private returns to R&D. This is because high private returns ensure private investment in R&D.

R&D AND GROWTH

Professor Kotowitz says **three arguments are put forward by the proponents of further government encouragement of R&D in Canadian industry. First**, it is argued that R&D is a major contributor to growth in general and to the growth of specific high-technology industries in particular. **Second**, firms that do undertake R&D are said to tend to expand and prosper at the expense of those that do not, particularly in high-technology industries. **Third**, higher R&D expenditure is said to lead successively to greater receptiveness to technological advances, more rapid diffusion of new technology and faster industrial growth.

R&D AND NATIONAL GROWTH

While the evidence is hardly conclusive, it suggests that in fact **R&D conducted within an individual country has little effect on productivity growth and may also have little effect on growth in general. For example, there is little evidence that the enormous postwar growth in R&D expenditure in the U.S. accelerated its growth rate during the 1960s and early 1970s. It therefore seems unlikely that the effects of R&D expenditure on growth would be significant for small countries such as Canada.**

The rate of industrial growth depends not only on innovations generated within the country but also on the pool of innovations available to a given industry wherever the innovations are generated. R&D in a small country such as Canada cannot possibly account for a major portion of world innovation: consequently most innovations adopted by domestic industry will originate outside the country. Rates of productivity growth in Canadian industry are, therefore, likely to be more affected by technological investment elsewhere than by research performed specifically in Canada, particularly because research intensity in Canada is low relative to that in the U.S. and other advanced countries.

R&D AND FIRM GROWTH

Professor Kotowitz says there is no doubt that the returns on successful innovations are quite high, whether they are measured in terms of financial return to the companies or in terms of company growth. However, the relationship between R&D intensity and firm profitability, whether in general or within specific industries, is less clear.

R&D AND DIFFUSION

It has not been established that the amount of R&D performed in Canada affects the degree of competitveness and profitability of Canadian industry, high-technology or otherwise, Professor Kotowitz says.

Clearly, many Canadian industries perform a considerable amount of R&D profitably, but it is not clear whether, at the margin, increased R&D would be highly productive. Even if the social benefits of growth in these industries exceed the private benefits – owing, for instance, to market imperfections that inhibit the private profitability of expansion in high-technology industries – it is far from clear that increased R&D is the best way to stimulate such growth. As this review of the evidence should suffice to show, arguments to the contrary must be based on faith rather than on science.

THE NATURE OF GOVERNMENT SUPPORT

To the extent that R&D is deemed desirable, Professor Kotowitz concludes that in principle, government should support R&D in a discretionary manner.

> **Yet in practice the government is unlikely to possess the extensive information it would need in order to apply differential rates optimally. Indeed, the quality of information and judgment necessary to apply a discretionary policy in an efficient manner in all probability simply cannot be available to governments. On the whole, the high cost of collecting and processing relevant information and of administering support programs implies that support for R&D should be administered in a relatively simple manner and with little discretion. Nevertheless, uniform support across all industries, firms and types of innovation may be costly and inefficient.**

Professor Kotowitz says that relatively competitive industries that serve Canadian customers and in which imitation is easy should in principle yield the highest returns from government support of R&D. 'To reduce duplication of effort and to achieve the greatest benefit from scale economies in R&D, such support should promote industry-wide co-operative research efforts. Since the danger that industry-wide organizations will become co-ordinators of cartels is insignificant in competitive industries, government subsidies for this purpose should yield benefits to consumers and to society as a whole.'

What form should these subsidies take? Professor Kotowitz says tax concessions, currently a major source of government support for R&D in Canada, would be quite ineffective in promoting co-operative research. Co-operative efforts require direct subsidies to industry-wide research co-operatives, he says, although these subsidies could perhaps be supplemented by tax concessions to participating firms based on their contributions to the co-operatives.

PROMOTION OF LEADERSHIP IN HIGH-TECHNOLOGY INDUSTRIES

Professor Kotowitz says a special case can be made for selective support of R&D

> **...in the pursuit of the major product and process innovations that Canada will need if it is to establish a significant competitive position in international markets for high-technology products in industries in which technical progress is extremely rapid (such as semiconductors, computers, communications, instruments, aerospace, and nuclear technology) and in which Canadian corporations already have some market presence and competence.**

He says sponsors may expect that these firms will create social benefits in the form of spinoffs to local suppliers and increased wages, given the locational advantages of the local industries that will supply the dominant firm or use its products. The achievement of such a dominant position, it is often argued, may require priority in innovation.

> **Owing to the small size of the Canadian market, firms tend to be relatively small and to lack the financial, technical, and marketing resources necessary for success. Moreover, because many foreign firms are heavily supported by their governments, the expected private rate of return to Canadian innovators is likely to be very low; consequently even firms that might possess some advantages in such competition will be reluctant to enter the race, unless they are supported by the government. However, unless government support significantly increases the chances of winning, such support seems unlikely to yield a positive long-term social return.**

Professor Kotowitz says **'the case for promoting major innovation in order to establish a strong market presence in specific high-technology growth industries may involve different strategies for government support. This study says that owing to the massive investment required in this case, general assistance programs such as tax concessions and general R&D subsidies are not likely to be effective.'**

However, the choice of industries and firms to be supported is difficult, and requires judgment and expertise. Governments seem unlikely to have much expertise in making wise choices in these matters, especially since political considerations of the 'pork barrel' or regional development variety frequently intrude upon commercial decisions. He says government ownership of such firms may be particularly dangerous, since unsuccessful government ventures can be protected from the appearance of failure through regulation and procurement policies.

Professor Kotowitz refers to research which suggests that countries that tend to support R&D in a general way are more successful than those closely involved in the R&D effort ... In principle, a policy of limits on the number of potential competitors in major innovations via government commitment to support major R&D efforts in selected industries has some merit. In practice, however, the application of such a policy is likely to be costly and ineffective, particularly in a small country such as Canada.

GOVERNMENTS APPEAR TO BE POOR LOSERS

Unlike firms which have no option but to cut their losses and depart, governments may stay in the game even after their champions have lost. The political need to justify past actions may increase the usual pressures on the government to support ailing industries. It can be exceedingly difficult for a government to withdraw support from a firm or industry created because of government direction.

> **'The positive industrial policy of today may well contain the seeds of negative industrial policy tomorrow. One example of this pattern may be the reluctance of the Canadian government to stop supporting the Canadian nuclear and aerospace industries, in spite of staggering losses and dim prospects.'**

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Positive Industrial Policy: The Implications for R&D, 48 pages, price $3.00, is available at the following outlets:

The Ontario Government Bookstore, 880 Bay Street, Toronto, to those shopping in person. Out-of-town customers may write: Ministry of Government Services, Publications Section, Fifth Floor, 880 Bay Street, Toronto, Ontario, M7A 1N8, or telephone 965-6015 (toll-free long distance, 1-800-268-7540; in northwestern Ontario, 0-Zenith 67200). Prepayment is required. Mastercard and VISA are accepted. Cheques or money orders should be made payable to the Treasurer of Ontario.

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